

**DOCUMENTATION OF ENVIRONMENTAL INDICATOR DETERMINATION**

Interim Final 2/5/99

**RCRA Corrective Action  
Environmental Indicator (EI) RCRIS code (CA725)****Current Human Exposures Under Control**

**Facility Name:** Gem Management, Inc. (former Olin Hunt)  
**Facility Address:** One Wellington Road, Lincoln, Rhode Island, 02865  
**Facility EPA ID #:** RID095976544

1. Has all available relevant/significant information on known and reasonably suspected releases to soil, groundwater, surface water/sediments, and air, subject to RCRA Corrective Action (e.g., from Solid Waste Management Units (SWMU), Regulated Units (RU), and Areas of Concern (AOC)), been considered in this EI determination?

  X   If yes - check here and continue with #2 below.

       If no - re-evaluate existing data, or

       if data are not available skip to #6 and enter "IN" (more information needed) status code.

**BACKGROUND****Definition of Environmental Indicators (for the RCRA Corrective Action)**

Environmental Indicators (EI) are measures being used by the RCRA Corrective Action program to go beyond programmatic activity measures (e.g., reports received and approved, etc.) to track changes in the quality of the environment. The two EI developed to-date indicate the quality of the environment in relation to current human exposures to contamination and the migration of contaminated groundwater. An EI for non-human (ecological) receptors is intended to be developed in the future.

**Definition of "Current Human Exposures Under Control" EI**

A positive "Current Human Exposures Under Control" EI determination ("YE" status code) indicates that there are no "unacceptable" human exposures to "contamination" (i.e., contaminants in concentrations in excess of appropriate risk-based levels) that can be reasonably expected under current land- and groundwater-use conditions (for all "contamination" subject to RCRA corrective action at or from the identified facility (i.e., site-wide)).

**Relationship of EI to Final Remedies**

While Final remedies remain the long-term objective of the RCRA Corrective Action program the EI are near term objectives, which are currently being used as Program measures for the Government Performance and Results Act of 1993, GPRA). The "Current Human Exposures Under Control" EI are for reasonably expected human exposures under current land- and groundwater-use conditions ONLY, and do not consider potential future land- or groundwater-use conditions or ecological receptors. The RCRA Corrective Action program's overall mission to protect human health and the environment requires that Final remedies address these issues (i.e., potential future human exposure scenarios, future land and groundwater uses, and ecological receptors).

**Duration / Applicability of EI Determinations**

EI Determinations status codes should remain in RCRIS national database ONLY as long as they remain true (i.e., RCRIS status codes must be changed when the regulatory authorities become aware of contrary information).

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2. Are groundwater, soil, surface water, sediments, or air **media** known or reasonably suspected to be “contaminated”<sup>1</sup> above appropriately protective risk-based “levels” (applicable promulgated standards, as well as other appropriate standards, guidelines, guidance, or criteria) from releases subject to RCRA Corrective Action (from SWMUs, RUs or AOCs)?

	Yes	No	?	Rationale / Key Contaminants
Groundwater		X		Groundwater objectives achieved and Letter of Compliance issued June 10, 2002
Air (indoors) <sup>2</sup>		X		N/A
Soil (surface, e.g., <2 ft)		X		N/A
Surface Water		X		N/A
Sediment		X		N/A
Soil (subsurface e.g., >2 ft)		X		N/A
Air (outdoors)		X		N/A

  X   If no (for all media) - skip to #6, and enter “YE,” status code after providing or citing appropriate “levels,” and referencing sufficient supporting documentation demonstrating that these “levels” are not exceeded.

       If yes (for any media) - continue after identifying key contaminants in each “contaminated” medium, citing appropriate “levels” (or provide an explanation for the determination that the medium could pose an unacceptable risk), and referencing supporting documentation.

       If unknown (for any media) - skip to #6 and enter “IN” status code.

**Rationale and Reference(s):**

In late 1979 groundwater contaminated with volatile organic compounds (VOCs) was discovered in the North Central Industrial Park (NCIP), Lincoln. Several sources of the groundwater contamination were identified in the NCIP, including leaks from Hunt Chemical’s underground piping for its waste water treatment system. Hunt Chemical property was placed on CERCLIS in 1981. Between 1983 and 1984 Olin Corporation purchased the Hunt Chemical property (now referred to as the Olin Limerock Facility). Operations at the facility ceased in January 1991. Olin began to manage groundwater contamination on a “voluntary” basis in October 1988. The remedy consisted of a groundwater pump & treat system which incorporated interceptor wells, monitoring wells, piezometers, carbon treatment of extracted water, NBC discharge under a POTW permit, and quarterly monitoring. This system was not formally approved under the Remediation Regulations until November 20, 1998, through an Order of Approval which added a bioremediation component consisting of biosparging and bioventing to augment the then ongoing pump & treat system. The remedial objectives (on-site – DEM’s Method 1 GB Groundwater Objectives; and at the

<sup>1</sup> “Contamination” and “contaminated” describes media containing contaminants (in any form, NAPL and/or dissolved, vapors, or solids, that are subject to RCRA) in concentrations in excess of appropriately protective risk-based “levels” (for the media, that identify risks within the acceptable risk range).

<sup>2</sup> Recent evidence (from the Colorado Dept. of Public Health and Environment, and others) suggest that unacceptable indoor air concentrations are more common in structures above groundwater with volatile contaminants than previously believed. This is a rapidly developing field and reviewers are encouraged to look to the latest guidance for the appropriate methods and scale of demonstration necessary to be reasonably certain that indoor air (in structures located above (and adjacent to) groundwater with volatile contaminants) does not present unacceptable risks.

**downgradient property line – DEM's Method 1 GA Groundwater Objectives) have been achieved, and a Letter of Compliance was issued by DEM on June 10, 2002.**

**Order of Approval, November 20, 1998 - ATTACHED**

**Letter of Compliance, June 10, 2002 - ATTACHED**

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3. Are there **complete pathways** between "contamination" and human receptors such that exposures can be reasonably expected under the current (land- and groundwater-use) conditions?

**Summary Exposure Pathway Evaluation Table**

Contaminated Media	Potential Human Receptors (Under Current Conditions)						
	Residents	Workers	Day-Care	Construction	Trespassers	Recreation	Food <sup>3</sup>
Groundwater							
Air (indoors)							
Soil (surface, e.g., <2 ft)							
Surface Water							
Sediment							
Soil (subsurface e.g., >2 ft)							
Air (outdoors)							

Instructions for Summary Exposure Pathway Evaluation Table:

1. Strike-out specific Media including Human Receptors' spaces for Media which are not "contaminated") as identified in #2 above.
2. enter "yes" or "no" for potential "completeness" under each "Contaminated" Media - Human Receptor combination (Pathway).

Note: In order to focus the evaluation to the most probable combinations some potential "Contaminated" Media - Human Receptor combinations (Pathways) do not have check spaces ("\_\_\_"). While these combinations may not be probable in most situations they may be possible in some settings and should be added as necessary.

\_\_\_\_\_ If no (pathways are not complete for any contaminated media-receptor combination) - skip to #6, and enter "YE" status code, after explaining and/or referencing condition(s) in-place, whether natural or man-made, preventing a complete exposure pathway from each contaminated medium (e.g., use optional Pathway Evaluation Work Sheet to analyze major pathways).

\_\_\_\_\_ If yes (pathways are complete for any "Contaminated" Media - Human Receptor combination) - continue after providing supporting explanation.

\_\_\_\_\_ If unknown (for any "Contaminated" Media - Human Receptor combination) - skip to #6 and enter "IN" status code

Rationale and Reference(s):

<sup>3</sup> Indirect Pathway/Receptor (e.g., vegetables, fruits, crops, meat and dairy products, fish, shellfish, etc.)

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4 Can the exposures from any of the complete pathways identified in #3 be reasonably expected to be "significant"<sup>4</sup> (i.e., potentially "unacceptable" because exposures can be reasonably expected to be: 1) greater in magnitude (intensity, frequency and/or duration) than assumed in the derivation of the acceptable "levels" (used to identify the "contamination"); or 2) the combination of exposure magnitude (perhaps even though low) and contaminant concentrations (which may be substantially above the acceptable "levels") could result in greater than acceptable risks)?

\_\_\_\_\_ If no (exposures can not be reasonably expected to be significant (i.e., potentially "unacceptable") for any complete exposure pathway) - skip to #6 and enter "YE" status code after explaining and/or referencing documentation justifying why the exposures (from each of the complete pathways) to "contamination" (identified in #3) are not expected to be "significant."

\_\_\_\_\_ If yes (exposures could be reasonably expected to be "significant" (i.e., potentially "unacceptable") for any complete exposure pathway) - continue after providing a description (of each potentially "unacceptable" exposure pathway) and explaining and/or referencing documentation justifying why the exposures (from each of the remaining complete pathways) to "contamination" (identified in #3) are not expected to be "significant."

\_\_\_\_\_ If unknown (for any complete pathway) - skip to #6 and enter "IN" status code

Rationale and Reference(s):

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<sup>4</sup> If there is any question on whether the identified exposures are "significant" (i.e., potentially "unacceptable") consult a human health Risk Assessment specialist with appropriate education, training and experience.

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**5 Can the "significant" exposures (identified in #4) be shown to be within acceptable limits?**

- ☐ If yes (all "significant" exposures have been shown to be within acceptable limits) - continue and enter "YE" after summarizing and referencing documentation justifying why all "significant" exposures to "contamination" are within acceptable limits (e.g., a site-specific Human Health Risk Assessment).
- ☐ If no (there are current exposures that can be reasonably expected to be "unacceptable")- continue and enter "NO" status code after providing a description of each potentially "unacceptable" exposure.
- ☐ If unknown (for any potentially "unacceptable" exposure) - continue and enter "IN" status code

**Rationale and Reference(s):**

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6. Check the appropriate RCRIS status codes for the Current Human Exposures Under Control EI event code (CA725), and obtain Supervisor (or appropriate Manager) signature and date on the EI determination below (and attach appropriate supporting documentation as well as a map of the facility):

X YE - Yes, "Current Human Exposures Under Control" has been verified. Based on a review of the information contained in this EI Determination, "Current Human Exposures" are expected to be "Under Control" at the Gem Management, Inc. (former Olin Hunt) facility, EPA ID # RID095976544, located at One Wellington Road, Lincoln, Rhode Island, 02865 under current and reasonably expected conditions. This determination will be re-evaluated when the Agency/State becomes aware of significant changes at the facility.

\_\_\_ NO - "Current Human Exposures" are NOT "Under Control."

\_\_\_ IN - More information is needed to make a determination.

Completed by

Joseph T. Martella II  
Senior Sanitary Engineer

Date 7-13-11

Supervisor

Kelly J. Owens  
Kelly J. Owens  
Supervising Engineer  
EPA Region 1, Rhode Island

Date 7/13/11

Locations where References may be found:  
RIDEM/OWM FILE

REVD BY F.B.  
OK - 7/13/11  
Frank Balthasar

Contact telephone and e-mail numbers

Name: Joseph T. Martella II  
Phone: (401) 222-2797 x7109  
E-mail: joseph.martella@dem.ri.gov

**FINAL NOTE: THE HUMAN EXPOSURES EI IS A QUALITATIVE SCREENING OF EXPOSURES AND THE DETERMINATIONS WITHIN THIS DOCUMENT SHOULD NOT BE USED AS THE SOLE BASIS FOR RESTRICTING THE SCOPE OF MORE DETAILED (E.G., SITE-SPECIFIC) ASSESSMENTS OF RISK.**



**RHODE ISLAND  
DEPARTMENT OF ENVIRONMENTAL MANAGEMENT**

235 Promenade Street, Providence, RI 02908-5767

TDD 401-831-5508

**CERTIFIED MAIL**

November 2<sup>6</sup> 1998

Michael J. Bellotti, P.G.  
Senior Associate Hydrogeologist  
Olin Chemicals - Olin Corporation  
P.O. Box 248  
Lower River Road  
Charleston, TN 37310

RE: Olin Limerock Facility  
One Wellington Road, Lincoln, Rhode Island  
Case No. 98-035

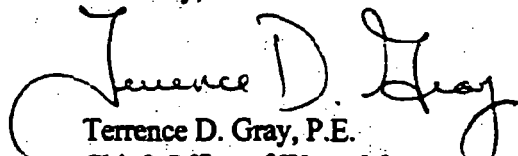
Dear Mr. Bellotti:

Enclosed please find the **Order of Approval** (Order) for the proposed groundwater remediation for the above referenced site. Please review the stipulations of this Order thoroughly to ensure your compliance with the requirements.

Please notify this office 48 hours prior to the beginning of any work related to the remediation of the property. If you have any questions regarding this matter, please contact Joseph T. Martella II at (401)-222-2797, ext. 7109.

This order shall be recorded in the land evidence records of the facility's town as required by law.

Sincerely,

  
Terrence D. Gray, P.E.  
Chief, Office of Waste Management

cc: Ed Szymanski, Associate Director, RIDEM  
Greg S. Fine, Supervising Engineer, RIDEM/OWM  
Joseph T. Martella II, Engineer, RIDEM/OWM  
Claude Cote, Esquire, RIDEM/Office of Legal Services  
Janet Whelan, Olin

DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

In the matter of the application  
for Remedial Action Approval at:  
**Olin Limerock Facility**  
**One Wellington Road**  
**Lincoln, Rhode Island**

Case No. 98-035

ORDER OF APPROVAL

In the above entitled matter wherein Olin Corporation (Olin), in its capacity as Owner of the Olin Limerock Facility site located at One Wellington Road in Lincoln, Rhode Island, more specifically identified as Lots 2 and 137 of Plat 28 in the Town of Lincoln, Rhode Island, filed with the Rhode Island Department of Environmental Management, Office of Waste Management (the Department) the following documents which collectively fulfill the requirements of Section 9.00 Remedial Action Work Plan (RAWP) of the Department's amended Rules and Regulations for the Investigation and Remediation of Hazardous Material Releases (Remediation Regulations):

Remedial Action Work Plan, For The Limerock Facility, Lincoln, Rhode Island,  
prepared by Envirogen, Inc. dated July 1997;

Letter response to the Department's comments prepared by Olin dated 23 October 1997;

Letter response to the Department's comments prepared by Olin dated 9 September 1998;

Letter response to the Department's comments prepared by Olin dated 16 September 1998; and

RAWP addendum letter prepared by Olin dated 7 October 1998.

The RAWP describes a plan or means to prevent pollution as defined in Chapter 46-12 of the General Laws of 1956, as amended and the Department's Remediation Regulations, as amended August 1996 in accordance therewith.

Upon consideration thereof, the Department approves said plan or means to prevent pollution provided that:

1. The remedy as described in the RAWP shall be implemented within ninety (90) days of receipt of this Order;
2. Sampling of all media involved in the Remedial Action shall be conducted in accordance with the requirements of the RAWP and its addendum;

3. The on-site groundwater remediation goal shall be the Department's Method 1 GB Groundwater Objectives, with the additional application of the Department's Method 1 GA Groundwater Objective for xylene, in accordance with the Remediation Regulations. The groundwater remediation goal at the downgradient property boundary shall be the Department's Method 1 GA Groundwater Objectives in accordance with the Remediation Regulations;
4. The remedy as described in the RAWP shall incorporate the existing operating groundwater pump and treat component and the Department approved bioremediation component consisting of biosparging and bioventing;
5. Quarterly sampling to monitor the groundwater quality shall be conducted in all groundwater monitoring wells according to the RAWP and the Remediation Regulations and will continue until such time as the Department determines that acceptable levels of contamination have been achieved and the remedy has been deemed successful;
6. Removal of the remedial system at the conclusion of the remedy will be contingent upon final Department approval;
7. Remedial Action Status Report(s), periodic monitoring reports and a closure report shall be submitted to the Department in accordance with the RAWP and the Remediation Regulations;
8. Results of all environmental sampling and status reports shall be sent to the Department in accordance with item 14;
9. All waste derived from implementation of the RAWP shall be managed in accordance with the Remediation Regulations and Department Policy Memo 95-01;
10. Remedial work must be consistent with Section 11.00 Remedial Action in the Remediation Regulations;
11. The Department shall be immediately notified of any site or operation condition that results in non-compliance with this Order;
12. Any Remedial Action interruptions other than those necessary for sampling, inspection or adjustment of operation shall be reported to the Department by telephone within one (1) working day and in writing with seven (7) days in accordance with item 14;

13. This Order of Approval does not remove Olin's obligation to obtain any necessary permits from other state, local, or federal agencies;
14. All notices and submissions should be sent to:

Joseph T. Martella II  
Department of Environmental Management  
Office of Waste Management  
235 Promenade Street, 3<sup>rd</sup> Floor  
Providence, RI 02908-5767  
Telephone Number (401) 222-2797, Ext. 7109

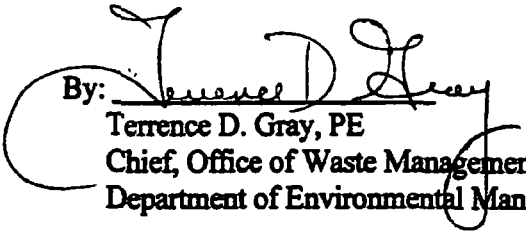
15. This Order shall be recorded in the Town land evidence records of the subject property.

This Order shall remain in full force and effect as long as said system or means shall be operated and maintained in a condition satisfactory to the Department of Environmental Management. Failure to comply with all points stipulated in this Order shall result in the issuance of a Notice of Violation and Order against the owner of the property.

This Order shall be subject to modification or revocation in accordance with the law.

Entered as an Order of the Department of Environmental Management this 20<sup>th</sup> day of November, 1998.

By:

  
Terrence D. Gray, PE  
Chief, Office of Waste Management  
Department of Environmental Management



RHODE ISLAND

DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

235 Promenade Street, Providence, RI 02908-5767

TDD 401-222-4462

June 10, 2002

**CERTIFIED MAIL**

**LETTER OF COMPLIANCE**

**CASE # 98-035**

Bruce R. Iannuccillo  
President  
BBI Realty, Inc.  
70 Calverley Street  
Providence, RI 02908

RE: Former Olin Limerock Facility, 1 Wellington Road, Lincoln, Rhode Island  
Plat 28, Lot 137

Dear Mr. Iannuccillo:

On 4 September 1996 the Rhode Island Department of Environmental Management (the Department) enacted the amended Rules and Regulations for the Investigation and Remediation of Hazardous Material Releases, (the Remediation Regulations). The purpose of these regulations is to create an integrated program requiring reporting, investigation and remediation of contaminated sites in order to eliminate and/or control threats to human health and the environment in an efficient manner.

In the matter of the above referenced site, the Department's Office of Waste Management (OWM) has received and reviewed the following documents submitted on behalf of the BBI Realty, Inc. (BBI) and Olin Corporation (Olin):

1. Olin Limerock Facility, Lincoln, RI Case No. 98-035, Quarterly Report: First Quarter, 1999, prepared by Olin, dated 28 May 1999;
2. Olin Limerock Facility, Lincoln, RI Case No. 98-035, Quarterly Report: Second Quarter, 1999, prepared by Olin, dated 30 August 1999;
3. Olin Limerock Facility, Lincoln, RI Case No. 98-035, Quarterly Report: Third Quarter, 1999, prepared by Olin, dated 9 November 1999;
4. Olin Limerock Facility, Lincoln, RI Case No. 98-035, Quarterly Report: Fourth Quarter, 1999, prepared by Olin, dated 31 January 2000;

Former Olin Limerock Facility, Plat 28, Lot 137  
1 Wellington Road, Lincoln, RI  
Letter of Compliance

June 10, 2002  
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5. Olin Limerock Facility, Lincoln, RI Case No. 98-035, Quarterly Report: First Quarter, 2000, prepared by Olin, dated 16 May 2000;
6. Olin Limerock Facility, Lincoln, RI Case No. 98-035, Quarterly Report: Second Quarter, 2000, prepared by Olin, dated 4 August 2000;
7. Olin Limerock Facility, Lincoln, RI, Case No. 98-035, Quarterly Report: Third Quarter, 2000, prepared by Olin, dated 22 November 2000;
8. Olin Limerock Facility, Lincoln, RI, Case No. 98-035, Quarterly Report: Fourth Quarter, 2000, prepared by Olin, dated 2 February 2001;
9. Quarterly Groundwater Sampling and Request for Interim Letter of Compliance, Former Olin Limerock Facility, 1 Wellington Avenue, Lincoln, Rhode Island, Case No. 98-035, prepared by BBI, dated 14 June 2001;
10. Quarterly Groundwater Sampling, Former Olin Limerock Facility, 1 Wellington Avenue, Lincoln, Rhode Island, Case No. 98-035, prepared by BBI, dated 21 July 2001;
11. Quarterly Groundwater Sampling, Former Olin Limerock Facility, 1 Wellington Avenue, Lincoln, Rhode Island, Case No. 98-035, prepared by BBI, dated 12 October 2001;
12. Quarterly Groundwater Sampling and Final Closure Report, Former Olin Limerock Facility, 1 Wellington Avenue, Lincoln, Rhode Island, Case No. 98-035, prepared by BBI, dated 2 March 2002; and
13. Copy of the recorded (stamped) Environmental Land Usage Restriction (ELUR) for Town of Lincoln Plat 28, Lot 137, submitted by BBI, recorded and received by the Department on 23 May 2002.

Based upon the information contained in these submittals and the recording of the ELUR on 23 May 2002, the Department has concluded that the above referenced property is in compliance with the Remediation Regulations at this time.

Be advised that the Department reserves the right to require additional actions under the aforementioned Remediation Regulations at the subject property should any of the following occur:

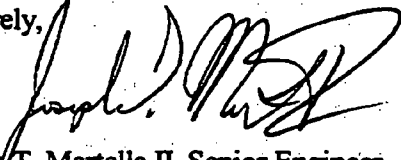
- A. Conditions at the site, previously unknown to the Department are discovered;
- B. Information, previously unknown to the Department becomes available;
- C. Policy and/or regulatory requirements change; or

- D. Failure by the BBI, or any future holder of any interest in the property, to adhere to the terms and conditions of the Environmental Land Usage Restriction for the property.

Nothing in this Letter of Compliance relieves the responsible party nor the site from compliance with all other applicable State or Federal regulations.

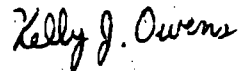
If you have any questions regarding this letter, please contact me at (401) 222-2797 x7109.

Sincerely,



Joseph T. Martella II, Senior Engineer  
Office of Waste Management  
Department of Environmental Management

Authorized by,



Kelly J. Owens, Supervising Engineer  
Office of Waste Management  
Department of Environmental Management

cc: Léo Hellested, P.E., Chief, RIDEM/OWM